

**What is Claimed is:**

1. A multi-channel variable optical attenuator comprising:

5 at least two optical signal transmission lines arranged parallel with each other, and having associated separating spaces formed between input and output terminals to adjust the power of an optical signal;

a screen placed in one of the separating spaces of the  
10 optical signal transmission lines, and being movable in a direction crossing the optical signal transmission lines; and

a Micro Electro Mechanical System (MEMS) actuator placed above one of the optical signal transmission lines, and connected with the screen to shift the same, wherein the MEMS actuator is  
15 placed above a first optical signal transmission line which is placed adjacent to a second optical signal transmission line for placing the screen therein.

2. The multi-channel variable optical attenuator as set  
20 forth in claim 1, wherein each of the optical signal transmission lines comprises an optical fiber.

3. The multi-channel variable optical attenuator as set forth in claim 1, wherein the separating spaces of the first and  
25 second optical signal transmission lines are arranged on

different lines.

4. The multi-channel variable optical attenuator as set forth in claim 1, wherein the separating spaces of the first and  
5 second optical signal transmission lines are arranged on the same line.

5. The multi-channel variable optical attenuator as set forth in claim 4, wherein the screen placed in the separating space  
10 is shaped to have a concave step at an upper end to avoid interference with other driving units.

6. The multi-channel variable optical attenuator as set forth in claim 1, wherein the MEMS actuator comprises a comb  
15 actuator.

7. The multi-channel variable optical attenuator as set forth in claim 1, wherein the screen is initially positioned to block light which propagates through the separating space, and  
20 pulled toward a driving unit when the driving unit is operated.

8. A method for fabricating a multi-channel variable optical attenuator, the method comprising the following steps of:  
preparing a Silicon-On Insulator (SOI) wafer having lower  
25 and upper Si layers and an oxide layer formed between the lower

and upper Si layers;

etching the upper Si layer and the oxide layer of the SOI wafer to form structures for receiving at least two optical signal transmission lines;

5 preparing a Si wafer having a Si layer;

etching the Si wafer to form a screen on the Si wafer;

bonding the Si wafer on the SOI wafer so that the screen of the Si wafer is placed between the structures of the SOI wafer;

etching the Si wafer to form MEMS actuators in the Si wafer;

10 and

inserting optical signal transmission lines between the structures of the SOI wafer.

9. The method for fabricating a multi-channel variable  
15 optical attenuator as set forth in claim 8, wherein each of the optical signal transmission lines comprises an optical fiber.

10. The method for fabricating a multi-channel variable  
optical attenuator as set forth in claim 9, wherein the screen  
20 is formed on a line different from that of an adjacent screen.

11. The method for fabricating a multi-channel variable  
optical attenuator as set forth in claim 9, wherein the screen  
is formed on a line same as that of an adjacent screen.

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12. The method for fabricating a multi-channel variable optical attenuator as set forth in claim 11, the screen placed is shaped to have a concave step at an upper end to avoid interference with other driving units.

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13. The method for fabricating a multi-channel variable optical attenuator as set forth in claim 8, wherein the MEMS actuator comprises a comb actuator.

10 14. A multi-channel variable optical attenuator comprising:

optical fibers forming at least two optical signal transmission lines arranged parallel with each other, the optical signal transmission lines having associated separating spaces  
15 formed on different lines between input and output terminals to adjust the power of an optical signal;

a screen placed in one of the separating spaces of the optical signal transmission lines to attenuate the optical signal, and being movable in a direction crossing the optical signal  
20 transmission lines;

a comb-type Micro Electro Mechanical System (MEMS) actuator placed above one of the optical signal transmission lines, and connected with the screen to shift the same, wherein the MEMS actuator is placed above a first optical signal transmission line  
25 which is placed adjacent to a second optical signal transmission

line for placing the screen therein; and

terminals connected with the comb-type MEMS actuator to apply electric current to the same.

5           15. The multi-channel variable optical attenuator as set forth in claim 14, wherein the screen is initially positioned to block light which propagates through the separating space, and pulled toward a driving unit when the driving unit is operated.

10           16. A multi-channel variable optical attenuator comprising:

optical fibers forming at least two optical signal transmission lines arranged parallel with each other, the optical signal transmission lines having associated separating spaces  
15 formed on a same line between input and output terminals to adjust the power of an optical signal;

a screen placed in one of the separating spaces of the optical signal transmission lines to attenuate the optical signal, being movable in a direction crossing the optical signal  
20 transmission lines, and being shaped to have a concave step at an upper end to avoid interference with other driving units;

a comb-type Micro Electro Mechanical System (MEMS) actuator placed above one of the optical signal transmission lines, and connected with the screen to shift the same, wherein the MEMS  
25 actuator is placed above a first optical signal transmission line

which is placed adjacent to a second optical signal transmission line for placing the screen therein; and

terminals connected with the comb-type MEMS actuator to apply electric current to the same.

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17. The multi-channel variable optical attenuator as set forth in claim 16, wherein the screen is initially positioned to block light which propagates through the separating space, and pulled toward a driving unit when the driving unit is operated.